near La Purisima in the Miocene Isidro Formation with *Rapana imperialis*, a cognate of the Holocene *R. bezoar* from the western Pacific and a descendant of *R. vaquerosensis* from the Oligocene of California. Systematic treatment is complicated for these taxa, many of which have different western Atlantic, western Mexican, Californian, and South American names.

An important question is: Did Tertiary Caribbean assemblages range northward to Baja California, or have some been transported as parts of tectonic terranes? Oceanic currents, possibly related to unusually strong El Niño effects, have been considered a likely vehicle for distribution, but many taxa (including *Melongena* and *Turritella*) undergo direct development or have a very short planktotrophic larval stage. Dispersal mechanisms must be determined for the whole Tertiary Caribbean assemblage and geographic range considered within a tectonostratigraphic context.

GALAPAGOS ISLANDS MARINE INVERTEBRATE EVOLUTION: A NEW PATTERN EMERGES. Matthew J. James and **Patrick F. Fields,** Department of Paleontology, University of California, Berkeley.

Consideration of some of the inherent biological differences between the well-known terrestrial biota and the marine invertebrate fauna of the Galapagos Islands has resulted in an alternative interpretation of evolutionary processes in the islands. Rates of evolution frequently associated with the Galapagos terrestrial biota are not substantiated by the marine invertebrate fauna. Contrasting marine invertebrate with terrestrial organisms highlights some fundamental differences having important evolutionary implications. Endemism at the specific and higher taxonomic levels is observed to be lower in the marine invertebrate fauna than in the terrestrial biota. The ability of many members of the former to disperse propagules (and thus genetic material) between populations, as compared to the less likely exchange between mainland and island terrestrial populations supports this idea. Consequently, marine invertebrates experience a lower degree of isolation and reduced frequency of endemicity at all taxonomic levels. Decreasing degrees of taxonomic difference are seen when comparing mainland to archipelago, inter-island, and intra-island terrestrial populations. Such differences usually exist for marine organisms only in the former comparison. Inter-island and intra-island population differences are obscured and/or supressed in the marine realm by difficulty in bathymetrically defining an island and by the ease of propagule exchange, discussed above. Differences in intrinsic rates of evolutionary change between vertebrate and invertebrate organisms could contribute additional reasons for the observed terrestrial and marine patterns. Evolutionary differences are reflected in the taxonomic hierarchy applied to Galapagos organisms. However, fossil evidence in the islands favors reconsideration of the taxonomic relationships of many marine organisms. Isolation, adaptive radiation, and speciation (evolutionary divergence) do not obtain as a viable evolutionary scenario for many marine invertebrate organisms in the Galapagos. In terms of Darwin's evolutionary scenario, terrestrial organisms represent the paradigm and marine organisms represent the paradox.

Note: A more detailed version of these ideas will appear as part of a symposium volume on evolution in the Galapagos Islands in the *Biol. Jour. Linn. Soc.* 21(1) Jan./Feb. 1984.

NAIADES OF THE CURRENT RIVER BASIN, MISSOURI. Alan C. Buchanan, Missouri Department of Conservation, Columbia.

Thirty-two species of naiades were found at 33 sites in the Current and Jacks Fork Rivers in southern Missouri and northern Arkansas. Twenty-nine species were found in Current River, including the endangered *Lampsilis orbiculata*. *Lampsilis reeviana* (40.3%), *Ptychobranchus occidentalis* (19.6%), *Cyclonaias tuberculata* (11.1%), *Pleurobema coccineum* (8.4%), *Fusconaia ozarkensis* (5.5%), and *Villosa iris iris* (4.1%) comprised 89% of the living naiades found in Current River. Fifteen species of naiades were found in Jacks Fork River, where *Lampsilis reeviana* (34.5%), *Ptychobranchus occidentalis* (30.8%), *Villosa iris iris* (11.4%), and *Fusconaia ozarkensis* (10.2%) comprised 86.9% of the living naiades found. Cold spring inflows reduced naiad abundance and species diversity both locally and over the length of Current and Jacks Fork Rivers.

A SURVEY OF THE FRESHWATER MUSSELS OF THE KANAWHA RIVER, WEST VIRGINIA. Ralph W. Taylor, Marshall University, Huntington, West Virginia.

A reconnaissance of the Kanawha River from head to mouth produced data on 27 species of freshwater mussels plus the Asian clam. The majority of specimens were found in a stretch of river, approximately five miles long, immediately below Kanawha Falls. Only six species of mussels were found above the falls.

The large population below Kanawha Falls is healthy and in no apparent danger at this time. It is located above slackwater and well above the navigation pool. Increased use of the Kanawha by barge traffic should have no effect on this population.

The lower 75 miles are presumed to be devoid of bivalve life with the exception of the Asian clam. Good populations of this clam were found sporadically along the reach of the river.

Two species of freshwater mussels, which are currently listed by the U.S.F.W.S. as endangered or threatened, have been reported in recent times as occurring in the Kanawha River headwaters. Only one of the two species, *Lampsilis orbiculata,* was found during this study. *Epioblasma t. torulosa* was not found and can be presumed to no longer survive in this drainage. *Lampsilis orbiculata* was found only in the stretch between Kanawha Falls and the head of slackwater. A fairly good-sized healthy population exists at this locality.